REMARKS

Rejections under 35 U.S.C. §112

Claims 17 and 21 stand rejected under 35 U.S.C. §112, second paragraph. Reconsideration of this rejection in view of the foregoing amendment is respectfully requested. It is noted that the amendments have not changed the scope of the claims, either literally or for the purpose of the doctrine of equivalents.

Rejections under 35 U.S.C. '103

Claims 1-2, 4-5 and 7-18 stand rejected under 35 U.S.C. §103 over Billion '209 in view of Kyyd '803 taken with Walker '768 and Cody et al '874. Reconsideration of this rejection is respectfully requested.

Billion discloses a process for the improved production of middle distillates with the production of high viscosity oils from heavy petroleum cuts. The steps involved in the process include a first step wherein a feedstock is contacted with an amorphous catalyst with a hydro-dehydrogenating function and a second step wherein the product of the first step is contacted with a second catalyst comprising a support, a Y zeolite, at least one group VIB element and at least one group VIII metal, in the presence of hydrogen. Billion further discloses that the product of the second step is fractionated to obtain a residue containing the oil and middle distillates and that a portion of the residue of the second step can be recycled and mixed back with the product of the first step, although the process is preferably carried out without recycling the residue to avoid polyaromatic compounds (col. 4, lines 8-12). Nowhere does Billion discloses or suggest that a fraction can be recycled, back to a first catalytic hydrogenating step. Specifically, Billion discloses that an unspecified portion of the fractionated oil residue can be recycled not to the first step, wherein the cut is contacted with hydrogen and a catalyst containing an amorphous support,

group VI and group VIII elements, but to the second step, wherein the product of this first step is contacted with a second, zeolite-based catalyst, see column 2, lines 49-55. Thus, the cited reference fails to disclose the presently claimed recycle step, in which a fraction of the oil residue having low viscosity, separated in step c), is recycled to the initial treatment of the feed with hydrogen and the non-zeolitic catalyst.

Walker fails to remedy any deficiency in Billion inasmuch as the secondary reference does not teach any particular recycle stream. There is no disclosure or suggestion in Walker that fractionate can be recycled back to a first catalytic hydrogenating step. Thus, it is submitted that these references in combination, fail to suggest the presently claimed process, and that a *prima face* case of obviousness has not been established.

Cody does not remedy the deficiencies of the first two discussed references, inasmuch as Cody teaches a complicated hydro-conversion process employing seven steps, which is largely non-analogous to the processees of the above discussed references. Thus, it is submitted that one of ordinary skill in the art would not extract any of the teachings of Cody for a combination with the primary or secondary references above, in view of such differences. Indeed, it is submitted that the hydroprocessing steps (two of the seven steps of Cody) are not comparable to those of the primary references.

Kydd discloses a hydroconversion process of heavy petroleum feedstocks containing preasphaltenes to produce lower-boiling hydrocarbon liquid products. Specifically, Kydd discloses that acid can be added to precipitate out and decompose the preasphaltenes and that the supernatant overflow material can be recycled back to the catalytic reaction zone for further hydroconversion (col. 1, lines 59- 68). However, Kydd does not cure any defect in the teaching of Billion as Kydd also does not disclose or suggest that fractionate can be recycled back to a first catalytic hydrogenating step. Moreover, Kydd is directed to hydrogenation reactions. By contrast,

Applicants' process also includes isomerisation and cracking reactions (see e.g., specification at page 2). One of ordinary skill in the art would not extract any of the teachings of Kydd for a combination with the primary or secondary references above, in view of such differences.

The attached 132 declaration provides further support for the non-obviousness of the instant invention. The declaration establishes that one of ordinary skill in the art would not be motivated to perform a recycle in a process such as that of the primary reference, as recycling would be expected to have a deleterious effect on the high viscosity index of the product. Example 3 in the declaration illustrates the impact on the invention when there is no recycling of any fraction obtained during the thermal diffusion step c). Without recycle, the viscosity index of the residue is 132. This is higher than the viscosity of the oil obtained with recycle, 129 (see Table 5). Accordingly, one of ordinary skill in the art would not be motivated to perform such a recycle, as recycling would be expected to have a deleterious effect on (i.e. would reduce) the high viscosity index of the product.

Despite this expectation, however, recycling is in fact advantageous, as clearly demonstrated in the 132 declaration. The declaration demonstrates substantially improved viscosity index, where fractionation with recycle is performed and the non-recycled streams are blended with the fractions which are recycled. Table 6 of the declaration shows the results obtained where there is no recycling (nine fractions are produced, and blended to form streams I and II which correspond respectively to the blend of fractions 1 to 6 and 7 to 9). Stream I is obtained with a conversion of 66% and a viscosity index of 158. Stream II exhibits a conversion of 34% an a viscosity of 75. Stream II is low yield and off-spec, i.e., not sustainable for use by itself. Stream I has a higher viscosity, but is produced with a yield which is well below 100%. By contrast in Example 2, where recycling occurs, there is no production of off-spec final product (all such fractions are recycled), a high viscosity index oil is obtained, in a yield that is

close to 100% by weight, and the amount of waste is minimized. One of ordinary skill in the art would simply not expect that fractionation when coupled with recycling would enable such an improvement in viscosity index. It is submitted that the declaration thus provides further evidence of non-obviousness of the present invention, and withdrawal of the rejection under 35 U.S.C. §103 is respectfully requested.

Claims 6 and 19-20 have also been rejected under 35 U.S.C. §103 over Billion taken with Walker and Garwood et al. '177. Reconsideration of this rejection is respectfully requested.

Garwood is cited solely for its teachings of dewaxing. Garwood does not remedy these deficiencies of the above discussed references in that it also fails to suggest the particular recycle as claimed. The combination of Garwood with any of the above-cited reference fails to render obvious the instant claims. Thus, it is submitted that this rejection should also be withdrawn.

The claims in the application are submitted to be in condition for allowance. However, should the examiner have any questions or comments, she is cordially invited to telephone the undersigned below.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend the claims as follows:

1. (Amended) A process for producing oils with a high viscosity index from a feed containing constituents with boiling points of more than about ~~300°C~~ 300°C comprising

a) reacting hydrogen with the feed or with a mixture of the feed with at least a fraction of a stream recycled from c), in the presence of a catalyst comprising at least one amorphous non zeolitic matrix and at least one metal or compound of a metal from group VIII of the periodic table and/or at least one metal from group VIB to produce an effluent;

c) fractionating at least a portion of the liquid effluent obtained from a) so as to separate at least one oil residue comprising mainly constituents with viscosity indices which are higher than that of the feed;

c) fractionating at least a portion of the oil residue obtained in b) by thermal diffusion into oil fractions with high viscosity indices and separating the oil fractions in accordance with their viscosity index, and
recycling at least part of at least one fraction with low viscosity index from c) to a).

17. (Amended) A process according to claim 15, in which the catalyst for d) comprises a total concentration of oxides of metals from groups VIB and VIII in the range from about 1% to 40% by weight, the ratio between the group ~~VI~~ VIB metal and the group VIII metal expressed as metal oxides, being in the range about 20 to 1.25 by weight, and the

concentration of phosphorous oxides being less than about 15% by weight.

21. (Amended) A process according to claim ~~1~~ 2, further comprising

a) fractionating the effluent obtained from a) or d) in at least one separator, into at least one gaseous effluent, which is evacuated and into at least one liquid effluent which is sent to b).